

IN THE CLAIMS

1. (currently amended) A circular pole piece included in a magnetic circuit for magnetic resonance imaging (MRI), said circular pole piece ~~comprising~~comprising:

a center portion including the center of said circular pole ~~piece and~~piece and a first set having a plurality of directional magnetic sheet tiles layered based on directions of axes of easy magnetization; and

a marginal portion ~~including the margin thereof, wherein: the permeability~~surrounding the center portion, wherein a permeability which said center portion made of a first soft magnetic material exhibits with an external magnetic field applied thereto is higher than ~~the permeability~~a permeability of said marginal portion made of a second soft magnetic material.

2. (currently amended) A circular pole piece according to Claim 1, wherein ~~the soft magnetic materials to be made into said respective portions have different compositions~~a composition of the first soft magnetic material is different than a composition of the second soft magnetic material.

3. (currently amended) A circular pole piece according to Claim 1, wherein: ~~said center portion made of a soft magnetic material has a plurality of non-directional magnetic steel sheet tiles layered with the directions of the axes of easy magnetization thereof varied so that the tiles will exhibit a non-directional property as a whole; wherein a first of the directions of easy magnetization of a first of the directional magnetic sheet tiles is different than a second of the directions of a second of the directional magnetic sheet tiles, the directional magnetic sheet tiles of the first set collectively exhibit a non-directional property and are made from steel, and said marginal portion made of a soft magnetic material is formed with~~includes a second set of at least one non-directional magnetic steel sheet tile~~tile~~ devoid of an axis of easy magnetization.

4. (currently amended) A circular pole piece according to Claim 1, wherein: ~~said center portion made of a soft magnetic material has a plurality of~~

~~directional magnetic steel sheet tiles layered with the directions of the axes of easy magnetization thereof varied so that the tiles will exhibit a non-directional property as a whole, and has a non-directional magnetic steel sheet tile, which is devoid of an axis of easy magnetization, layered in combination with said directional magnetic steel sheet tiles; wherein the first set includes at least one non-directional magnetic sheet tile devoid of an axis of easy magnetization and layered in combination with the directional magnetic sheet tiles of the first set, a first of the directions of easy magnetization of a first of the directional magnetic sheet tiles is different than a second of the directions of a second of the directional magnetic sheet tiles, the directional magnetic sheet tiles of the first set collectively exhibit a non-directional property and are made from steel, and said marginal portion made of a soft magnetic material is formed with~~includes a second set of at least one non-directional magnetic steel sheet tile~~tile~~ devoid of an axis of easy magnetization.

5. (currently amended) A circular pole piece according to Claim 1, ~~wherein: said center portion made of a soft magnetic material has a plurality of directional magnetic steel sheet tiles layered with the directions of the axes of easy magnetization thereof varied so that the tiles will exhibit a non-directional property as a whole; and said marginal portion made of a soft magnetic material has a plurality of directional magnetic steel sheet tiles layered with the directions of the axes of easy magnetization thereof varied so that the tiles will exhibit a non-directional property as a whole, and has a non-directional magnetic steel sheet tiles, which is devoid of an axis of easy magnetization, layered in combination with said directional magnetic steel sheet tiles. wherein a first of the directions of easy magnetization of a first of the directional magnetic sheet tiles in the first set is different than a second of the directions of a second of the directional magnetic sheet tiles in the first set, the directional magnetic sheet tiles of the first set collectively exhibit a non-directional property and are made from steel, the marginal portion includes a second set having a plurality of directional magnetic sheet tiles layered based on directions of easy magnetization, a first of the directions of easy magnetization of a first of the directional magnetic sheet tiles in the second set is different than a second of the directions of a second of the directional magnetic sheet tiles in the second set, the directional magnetic sheet tiles in the second set collectively exhibit a non-directional property, are made from steel, and layered in combination with at least one non-~~

directional magnetic sheet tile of the second set, and the at least one non-directional magnetic sheet tile of the second set devoid of an axis of easy magnetization.

6. (currently amended) A circular pole piece according to Claim 1, ~~wherein said center portion made of a soft magnetic material and said marginal portion made of a soft magnetic material have a plurality of directional magnetic steel sheet tiles layered with the directions of the axes of easy magnetization thereof varied so that the tiles will exhibit a non-directional property as a whole wherein the~~ marginal portion includes a second set having a plurality of directional magnetic sheet tiles layered based on directions of easy magnetization, a first of the directions of easy magnetization of a first of the directional sheet tiles in the second set is different than a second of the directions of a second of the directional sheet tiles in the second set, the directional sheet tiles in the second set collectively exhibit a non-directional property and are made from steel.

7. (currently amended) A circular pole piece according to Claim 1, ~~wherein said center portion made of a soft magnetic material and said marginal portion made of a soft magnetic material have a plurality of directional magnetic steel sheet tiles layered with the directions of the axes of easy magnetization thereof varied so that the tiles will exhibit a non-directional property as a whole, and have wherein a~~ first of the directions of easy magnetization of a first of the directional magnetic sheet tiles in the first set is different than a second of the directions of a second of the directional magnetic sheet tiles in the first set, the directional magnetic sheet tiles of the first set collectively exhibit a non-directional property and are made from steel, the first set including at least one non-directional magnetic steel sheet tile, which is devoid of an axis of easy magnetization, magnetization and layered in combination with said directional magnetic steel sheet tiles.

8. (currently amended) A circular pole piece according to Claim 1, ~~wherein: said center portion made of a soft magnetic material and said marginal portion made of a soft magnetic material have a plurality of directional magnetic steel sheet tiles layered with the directions of the axes of easy magnetization thereof varied so that the tiles will exhibit a non-directional property as a whole, and have a wherein~~ the first set includes at least one non-directional magnetic sheet tile devoid of an axis of easy magnetization and layered in combination with the directional magnetic sheet

tiles of the first set, the marginal portion includes a second set having a plurality of directional magnetic sheet tiles layered based on directions of easy magnetization, a first of the directions of easy magnetization of a first of the directional magnetic sheet tiles in the second set is different than a second of the directions of a second of the directional magnetic sheet tiles in the second set, the directional magnetic sheet tiles in the second set collectively exhibit a non-directional property, are made from steel, and layered in combination with at least one non-directional magnetic steel sheet tile, which is the non-directional magnetic sheet tile of the second set devoid of an axis of easy magnetization, layered in combination with said directional magnetic steel sheet tiles; and the ratio of the at least one non-directional magnetic steel sheet tile in the second set to the directional magnetic steel sheet tiles in the second set is higher in said marginal portion made of a soft magnetic material than in said center portion made of a soft magnetic material; a ratio of the at least one non-directional magnetic sheet tile in the first set to the directional magnetic sheet tiles in the first set.

9. (currently amended) A circular pole piece according to Claim 1, ~~wherein: said center portion made of a soft magnetic material has a plurality of directional magnetic steel sheet tiles layered with the directions of the axes of easy magnetization thereof varied so that the tiles will exhibit a non-directional property as a whole;~~wherein a first of the directions of easy magnetization of a first of the directional magnetic sheet tiles is different than a second of the directions of a second of the directional magnetic sheet tiles, the directional magnetic sheet tiles of the first set collectively exhibit a non-directional property and are made from steel, and said marginal portion made of a soft magnetic material is formed with~~includes~~ ferrite tiles.

10. (currently amended) A circular pole piece according to Claim 1, ~~wherein: said center portion made of a soft magnetic material has a plurality of directional magnetic steel sheet tiles layered with the directions of the axes of easy magnetization thereof varied so that the tiles will exhibit a non-directional property as a whole, and has~~wherein the first set includes at least one non-directional magnetic steel sheet tile, which is devoid of an axis of easy magnetization, magnetization and layered in combination with said directional magnetic steel sheet tiles; tiles of the first set, a first of the directions of easy magnetization of a first of the directional magnetic sheet tiles is different than a second of the directions of a second of the directional

magnetic sheet tiles, the directional magnetic sheet tiles of the first set collectively exhibit a non-directional property and are made from steel and said marginal portion made of a soft magnetic material is formed with~~includes~~ ferrite tiles.

11. (currently amended) A circular pole piece according to Claim 1, wherein said center portion ~~made of a soft magnetic material is formed with~~includes amorphous soft magnetic material tiles, and said marginal portion ~~made of a soft magnetic material is formed with~~includes non-directional magnetic steel sheet tiles devoid of an axis of easy magnetization.

12. (currently amended) A circular pole piece according to Claim 1, wherein said center portion ~~made of a soft magnetic material is formed with~~includes Parmalloy tiles, and said marginal portion ~~made of a soft magnetic material is formed with~~includes non-directional magnetic steel sheet tiles devoid of an axis of easy magnetization.

13. (currently amended) A circular pole piece according to Claim 1, wherein said center portion ~~made of a soft magnetic material is formed with~~includes Parmalloy tiles, and said marginal portion ~~made of a soft magnetic material is formed with~~includes ferrite tiles.

14. (currently amended) An MRI system comprising a circular pole piece ~~comprising~~comprising:

a center portion made of a first soft magnetic ~~material and~~material; and

a marginal portion made of a second soft magnetic material and including a set of at least one non-directional magnetic sheet tile devoid of an axis of easy magnetization, said marginal portion circumscribing said center portion, wherein the ~~permeability~~permeability which said center portion exhibits when an external magnetic field is applied thereto is higher than ~~the permeability~~a permeability of said marginal portion when the external magnetic field is applied ~~thereto~~applied.